

CLAIMS

1. A method of transmitting a message from a wireless radio-frequency short-range communication network via a gateway to a network external to the communication network, the method comprising:

- 5 receiving a first message via a short-range radio link at the gateway from a terminal device of the short-range communication network, the first message being addressed to an element external to the short-range communication network, and the first message comprising a network address of the terminal device as a transmitter's address and a first port number as a source
10 port number, the network address of the terminal device being a network address that is used inside the short-range communication network, wherein the method further comprises:

allocating a second port number to the terminal device;

- replacing the network address of the terminal device in the first
15 message with a network address of the gateway and the first port number with the second port number;

- generating a correlation between the network address of the terminal device, the first port number and the second port number and storing said correlation in a memory available to the gateway for identification of the terminal device; and
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transmitting the first message from the gateway to the element external to the short-range communication network, the first message having the network address of the gateway as a transmitter's address and said second port number as a source port number.

- 25 2. A method as claimed in claim 1, the method further comprising:

- receiving, at the gateway, a particular second message from the element external to the short-range communication network, the second message being transmitted in response to the first message arrived at the element external to the short-range communication network, and the second message
30 comprising the network address of the gateway as a receiver's address and the second port number as a destination port number;

- replacing, in the second message at the gateway, based on said correlation, the network address of the gateway with the network address of the terminal device, and replacing the second port number with the first port
35 number;

transmitting the second message from the gateway to the terminal

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device in the short-range communication network over the short-range radio link.

3. A method as claimed in claim 1, wherein the network address of the terminal device is a virtual address used only inside the short-range communication network.

4. A method as claimed in claim 2, wherein the gateway comprises a network card and the messages are transmitted between the short-range communication network and the network external to the short-range communication network via said network card.

5. A method as claimed in claim 4, wherein the network address of the gateway (21) is an IP address (Internet Protocol) and is configured in advance by inputting the IP address in the terminal device of the short-range communication network, by transferring the IP address over a wireless short-range radio-frequency connection from the terminal device to the gateway and by using software to configure the network card based on the IP address received.

6. A method as claimed in claim 2, wherein the messages (41 to 42) are transmitted in at least one of the following packets: TCP/IP packet (Transmission Control Protocol/Internet Protocol), UDP/IP packet (User Datagram Protocol).

7. A method as claimed in claim 1, wherein the method comprises allocating, at the gateway, a particular number of said second port numbers in advance to the terminal device, and in response to the arrival of said first message at the gateway, replacing the first port number in the first message with one of the second port numbers allocated in advance to the terminal device.

8. A method as claimed in claim 7, wherein the particular number of second port numbers are allocated to said terminal device when the terminal device registers in the short-range communication network.

9. A method as claimed in claim 1, wherein the second port number is allocated to the terminal device in response to the arrival of the first message at the gateway, the first port number being replaced with the second port number in said first message.

10. A method as claimed in claim 1, wherein the gateway keeps a record of free port numbers and checks, in response to the arrival of the first message at the gateway, if the first port number in the first message is free.

11. A method as claimed in claim 10, wherein the gateway keeps a

antennas, the antenna of the WLAN transceiver being a directional antenna, in which method the antenna of the WLAN transceiver is directed away from the antenna of the Bluetooth transceiver at the gateway and towards the WLAN access point to reduce interference between the WLAN transceiver and the Bluetooth transceiver.

20. A method as claimed in claim 19, wherein the antenna of the Bluetooth transceiver at the gateway and the antenna of the WLAN transceiver are placed at a distance from one another to reduce interference.

21. A method as claimed in claim 19, wherein the gateway comprises more than one Bluetooth transceivers with antennas, the antennas of the Bluetooth transceivers being directional antennas that are directed in a different direction than the antenna of the WLAN transceiver.

22. A method as claimed in claim 17, wherein the WLAN network card acts as equal to the other network cards of the WLAN network.

23. A method as claimed in claim 17, wherein the WLAN network card acts as a slave to the network card of the WLAN access point that acts as a master.

24. A method as claimed in claim 1, wherein when the terminal device registers in the wireless short-range radio-frequency communication network, the terminal device assigns a unique Bluetooth identifier to the gateway and receives a virtual IP address from the gateway for use inside the short-range communication network.

25. A method of transmitting a message from an element external to a wireless short-range radio-frequency communication network via a gateway to a terminal device of the short-range communication network, the method comprising

selecting a first port number for the terminal device;

generating a correlation between a network address of the terminal device, said first port number and a particular second port number, the network address of the terminal device being a network address that is used inside the short-range communication network, and said second port number being intended to identify a right application in the terminal device, and storing said correlation in advance in a memory available to the gateway;

receiving a message at the gateway from the element external to the short-range communication network, the message comprising the network address of the gateway as a receiver's address and said first port number as a

destination port number;

replacing the network address of the gateway in the message with the network address of the terminal device and said first port number with the second port number, on the basis of said correlation;

5 transmitting the message from the gateway to the terminal device of the short-range communication network via a short-range radio link the message having the network address of the terminal device as a receiver's address and said second port number as a destination port number.

26. A method as claimed in claim 25, wherein the method comprises directing the message received at the terminal device to the right application based on the second port number.

27. A method as claimed in claim 25, wherein the storing is performed at least partly manually.

28. A method as claimed in claim 25, wherein the method comprises also storing a unique identifier of the terminal device in advance in the memory available to the gateway and receiving an inquiry at the gateway from outside said wireless short-range radio-frequency communication network, the inquiry inquiring, based on said unique identifier, about the first port number assigned to the terminal device.

29. A method as claimed in claim 28, wherein the method comprises transmitting said first port number in response to said inquiry to the outside of said wireless short-range radio-frequency communication network.

30. A method as claimed in claim 25, wherein in the method, the terminal device of the wireless short-range radio-frequency communication network is controlled with said message from outside the wireless short-range radio-frequency communication network.

31. A method as claimed in claim 28, wherein the wireless short-range radio-frequency communication network is a Bluetooth network and said unique identifier is a unique Bluetooth identifier.

32. A gateway for transmitting a message from a wireless radio-frequency short-range communication network via the gateway to a network external to the short-range communication network, the gateway comprising:

a short-range transceiver for receiving a first message at the gateway via a short-range radio link from a terminal device of the short-range communication network, the first message being addressed to an element external to the short-range communication network, and the first message

comprising the network address of said terminal device as a transmitter's address and the first port number as a source port number, the network address of the terminal device being a network address used inside the short-range communication network, wherein the gateway further comprises:

- 5 a processing element (CPU) for allocating a second port number to the terminal device;

a processing element (CPU) for replacing the network address of said terminal device in the first message with the network address of the gateway and for replacing the first port number in the first message with the second port number;

a processing element (CPU) for generating a correlation between the network address of the terminal device, the first port number and the second port number and storing it in a memory available to the gateway for identification of the terminal device;

15 a transceiver for transmitting the first message from the gateway to the element external to the short-range communication network, the first message having the network address of the gateway as a transmitter's address and said second port number as a source port number.

33. A gateway as claimed in claim 32, wherein said processing
20 element is one of the following: a microprocessor, a micro controller or a digital
signal processor.

34. A gateway for transmitting a message from an element external to a wireless short-range radio-frequency communication network via the gateway to a terminal device of the short-range communication network, wherein the gateway comprises:

a processing element (CPU) for selecting a first port number for the terminal device;

a processing element (CPU) for generating a correlation between a network address of the terminal device, said first number and a particular second port number and storing it in advance in a memory available to the gateway, the network address of the terminal device being a network address that is used inside the short-range communication network, and the second port number being intended for identifying a right application in the terminal device;

a transceiver for receiving a message at the gateway from the element external to the short-range communication network, the message comprising the network address of the gateway as a receiver's address and the

first port number as a destination port number;

a processing element (CPU) for replacing the network address of the gateway in the message with the network address of the terminal device and for replacing said first port number in said message with the second port

5 number, on the basis of said correlation;

a short-range radio-frequency transceiver for transmitting the message from the gateway to the terminal device of the short-range communication network via a short-range radio link, the message having the network address of the terminal device as a receiver's address and said second port

10 number as a destination port number.

35. Software executable at a gateway for transmitting a message from a wireless radio-frequency short-range communication network via the gateway to a network external to the short-range communication network, the software comprising:

15 program code for causing the gateway to receive a first message at the gateway via a short-range radio link from a terminal device of the short-range communication network, the first message being addressed to an element external to the short-range communication network and the first message comprising a network address of said terminal device as a transmitter's

20 address and a first port number as a source port number, the network address of the terminal device being a network address used inside the short-range communication network, wherein the software comprises:

program code for allocating a second port number to the terminal device;

25 program code for replacing the network address of said terminal device in the first message with the network address of the gateway and for replacing the first port number in the first message with the second port number;

30 program code for generating a correlation between the network address of the terminal device, the first port number and the second port number and storing it in a memory available to the gateway for identifying the terminal device;

35 program code for causing the terminal device to transmit the message from the gateway to the element external to the short-range communication network, the first message having the network address of the gateway as a transmitter's address and said second port number as a source port number.

36. Software executable at a gateway for transmitting a message from an element external to a wireless short-range radio-frequency communication network via the gateway to a terminal device of the short-range communication network, wherein the software comprises:

5 program code for selecting a first port number for the terminal device;

 program code for generating a correlation between the network address of the terminal device, said first port number and a particular second port number and for storing it in advance in a memory available to the gateway, the network address of the terminal device being a network address used
10 inside the short-range communication network, and said second port number being intended to identify the right application in the terminal device;

 program code for causing the gateway to receive a message at the gateway from the element external to the short-range communication network,
15 the message comprising the network address of the gateway as a receiver's address and said first port number as a destination port number;

 program code for replacing the network address of the gateway in said message with the network address of the terminal device and for replacing said first port number in said message with the second port number, on the
20 basis of said correlation;

 program code for causing the gateway to transmit the message from the gateway to the terminal device in the short-range communication network via a short-range radio link the message having the network address of the terminal device as a receiver's address and said second port number as
25 a destination port number.